

In the Drawing:

Replacement drawing sheets including amended figures 2 and 3 accompany this amendment. The drawing changes are explained in more detailed herein below.

Entry and approval of the changes in figures 2 and 3 is respectfully requested.

REMARKS

This amendment is filed in response to the non-final Office Action issued January 17, 2007.

I. ALLOWABLE APPARATUS CLAIMS

According to pages 1 and 2 of the Office Action apparatus claims 15 and 17 to 26 are allowable over the prior art of record.

Nevertheless some additional apparatus claims have been filed.

New dependent apparatus claim 27 (which depends on claim 15) limits the first light source to embodiments with two LEDs that produce light of different intensities or different colors. Basis for this claim is found on page 13, lines 16 to 20, and page 14, lines 20 to 22.

New independent claim 28 claims the preferred embodiment of the apparatus, which is described and based on page 15, lines 3 to 16, of the applicants' original specification. The first and second radiation sources in this embodiment are limited to pulsed light sources. This embodiment includes a controller that controls the first and second pulsed light sources so that the first pulsed light source emits light pulses exclusively and only in intervals between light pulses originating from the second pulsed light source. An example of this

sort of embodiment is described in more detail in connection with figures 2 to 4 in the amended specification.

The newly cited US 4,725,139 does not disclose or suggest the apparatus claimed in claim 15 or claim 28. US '139 discloses an apparatus with only one light source, a tunable laser 2 in fig. 6. Applicants' claimed apparatus contains two radiation or light sources 1, 5. Furthermore the apparatus of US '139 does not permit discrimination of defect types and no actual size measurement is possible. In preferred embodiments of applicants' apparatus the detector is a camera. US '139 does not teach imaging with a camera as detector, but instead merely measures intensities of scattered light in detector 7, which is apparent from figs. 1 to 5.

The other four prior art references mentioned on the PTO-892 attached to the Office Action were cited in the previous Office Action and thus were considered during the last examination.

II. ALLOWABLE METHOD CLAIMS

According to page 3 method claims 1, 2, and 4 to 14 would be allowed if rewritten and amended to overcome the rejection under 35 U.S.C. 101.

The main method claim 1 was amended to overcome the rejection under 35 U.S.C. 101. Also a new independent method claim 29 has been filed including the features and limitations of claim 1 and also additional limitations to overcome the rejection under 35 U.S.C. 101 in a somewhat different manner from claim 1

Claim 29 is of a somewhat different scope than claim 1. The changes made to overcome the rejection under 35 U.S.C. 101 are explained further herein below.

The method of claim 1 is, according to page 3, second paragraph, of the Office Action allowable over the prior art of record, taken alone or in combination, because the prior art fails to disclose or render obvious step d) of claim 1, namely “determining a fault type of said fault from a ratio of a bright field signal to a scattered light signal or from a ratio of a deflection signal to said scattered light signal”, in combination with the other limitations in steps a) to c).

Four of the five prior art references that were provided on the PTO-892 form are exactly the same as the four prior art references that were considered during examination of the method claims in the previous amendment filed on March 29, 2007.

The newly cited prior art reference, US '139, issued to Hack, et al, does not disclose or suggest the critical distinguishing limitation in the amended method claim 1, namely “determining the fault type of the fault from a ratio of a bright field signal to a scattered light signal or from a ratio of a deflection signal to the scattered light signal” in combination with the other claim limitations in the new claim 1. Also this reference does not disclose passing light from two different light sources at the same time through the predetermined volume within the transparent manufactured material.

In addition, in the method of US '139 only intensities of detected light are measured, as noted above. This method does not include imaging, e.g. with a camera, to detect a bright field signal, from which one can obtain the size of the

fault or faults detected. Also US '139 is not limited to finding faults that are only in the interior of the transparent manufactured sheet. Discrimination of faults is not possible, because the three different types of detected signals are not produced.

Thus the prior art references listed on the form PTO-892 attached to the Office Action of January 17, 2007, which are considered pertinent to the method disclosed by the applicants, do not disclose or suggest the methods claimed in amended claim 1 and new method claim 29.

The amended method claims and new method claim 29 should not be rejected as anticipated under 35 U.S.C. 102 (b) by any of these prior art references of record or as obvious under 35 U.S.C. 103 (a) over any combination of these prior art references of record.

III. REJECTION OF THE METHOD CLAIMS FOR CLAIMING NON-STATUTORY SUBJECT MATTER

Method claims 1, 2 and 4 to 14 were rejected for being directed to non-statutory subject matter.

Since the steps of the independent method claims do not physically or chemically transform an article or thing into a different state or thing, according to M.P.E.P. 2106, the claimed methods must comprise useful, concrete and tangible results in order to qualify as statutory subject matter. The Office Action indicates that the claimed method appears useful and concrete but alleges that the unchanged claimed method of the previously pending claim 1 does not have a tangible result.

Amended method claim 1 and new claim 28 claim methods, which are practical applications of light scattering measurements, bright field absorption measurements and/or light deflection measurements (measurements of natural phenomenon) to test a transparent manufactured material, such as a sheet of glass, to determine if the transparent manufactured material meets specifications regarding the number, size and type of the faults, such as bubbles and inclusions in glass, present in the transparent manufactured material.

The preambles of both independent method claims read as follows:
"method for detecting faults in a transparent manufactured material in order to ascertain whether or not the transparent manufactured material meets predetermined specifications during quality control testing".

Thus the claim methods are clearly practical and useful applications of the measurement of natural phenomenon, namely light scattering, bright field absorption and/or light deflection, to determine if a transparent manufactured material such as glass meets certain specifications regarding the number, size and type of faults present in it. It should be apparent that a transparent material, such as glass for a window or for optical applications, must not have too many bubbles or opaque inclusions of a certain sizes. It is therefore desirable and useful that the number, size and type of faults present be ascertained. The manufacturer can then decide to modify the manufacturing method if the product does not meet specifications and/or to discard pieces of the transparent manufactured material that do not meet the specifications.

The claimed methods of claims 1 and 29 are **concrete** because they would be repeatable and predictable for the particular sample of the transparent

manufactured material used for the particular application involved. See M.P.E.P. 2106 IV. C. 2. (B) (2) section b. The bright field signal intensity of the bright field signal from the fault exposed to light from one light source and the scattered-light signal intensity of the scattered light from the fault exposed to light from another light source are well-defined physically measurable variables. Experiments that measure these physical parameters should be repeatable if properly performed by one of ordinary skill in the art. The calculation of the ratio of these signal intensities would be repeatable given the same parameters. The determination of the suitability of the material would depend on criteria that vary from application to application but would be based on the type of fault that is determined from the calculated ratio as well as the number and size of the faults. Obviously glass that is used for optical and spectroscopic sample cell purposes, for example, must have much fewer faults, which must be smaller, than the faults in e.g. window glass used in dwellings.

Claim 1 has been amended to add the step e) of outputting a signal containing information regarding the result. The specification teaches that the detector is connected to an analyzing or evaluating unit for processing the detected signals on page 15, lines 14 to 16, of the originally filed specification. In other words, the specification teaches a processor or computer to process the various signals of step c) of claim 1. However by definition a processor must have an output signal by definition so that the additional step e) of amended claim 1 is not "new matter" and describes a **tangible real world** result because a signal is a real world result, since it must be manifested as a disturbance of an

electromagnetic field or time-varying current that conveys the information regarding fault type according to said ratio determined in step d).

It is respectfully submitted that the **output signal** according to step e) of the amended claim 1 is a **real tangible result**. The issue of whether or not functional signals constitute patentable subject matter is reviewed in J. P.T.O.S. 89, #2, pp. 93 - 129 (2007). Also see the judicial decision in O'Reilly v. Morse, 56 US 62, 119 (1854). Note further that the applicants teach that the deflection signal is a ratio that is equal to the difference of two voltage signals U_1 and U_2 divided by their sum on page 14, lines 3 to 7, of the originally filed specification. Thus the signal can be interpreted as being defined in the specification as a time varying voltage or current produced by the analyzing unit, which is a tangible thing.

The new claim 29 has been drafted somewhat differently to obtain a claim that is directed to statutory subject matter. The new steps e and f are basically the following: providing the analyzing unit of claim 15, lines 14 to 16, and outputting the type of fault according to the ratio determined in step d) from the analyzing unit of claim 15. Thus claim 29 is more limited than claim 1.

Amended claim 1 is broader because the output signal of step e) could either be used in an entirely automatic method to discard unacceptable pieces of the transparent manufactured material in an automated plant manufacturing the material or it could be displayed on a computer monitor screen or printed so that the manufacturer or his employee could decide to continue or stop the manufacturing process.

In the case of claim 29 the processor or analyzing unit simply displays the result of the quality control, namely the type of fault or faults observed during the determinations based on the ratio of step d).

It is respectfully submitted that both new method claim 29 and amended claim 1 are fully supported by the applicants' originally filed specification and are directed to statutory subject matter because the claimed methods have a real world tangible result in accordance with M.P.E.P. 2106.

For the foregoing reasons and because of the wording changes in method claim 1 withdrawal of the rejection of amended method claims 1, 2 and 4 to 14 under 35 U.S.C. 101 is respectfully requested.

Furthermore it is respectfully submitted that new independent method claim 29 should not be rejected under 35 U.S.C. 101 for the above reasons.

IV. DRAWING CHANGES

Amended figures 2 and 3 accompany this amendment.

Figures 1 and 2 contained duplicate drawing reference number (5) for different elements of the claimed apparatus. The reference number "5" in claim 2 was changed to "15" to correct this deficiency.

Furthermore each and every element of a claimed apparatus should be illustrated in the drawing. For that reason the analyzing unit 23 and the controller 21 for controlling the light sources 1 and 5 was added to figure 2, since these elements or parts of the apparatus are included in the apparatus claims.

However no new matter has been added because these parts or elements are mentioned on page 15 of the originally filed specification. Furthermore additional description has been added to the specification on page 17 to refer to the new drawing reference numbers. The subject matter added to page 17 has been taken from page 15.

Some corrections for lead lines in fig. 3 were necessary because the arrow heads were incorrectly placed.

Also labels have been added to the drawing to make the purpose and function of the parts of the apparatus more readily understandable.

Entry and approval of the changes in figs. 2 and 3 is respectfully requested.

V. SPECIFICATION CHANGES

A number of changes were made in the specification, especially in the detailed description, to provide an accurate and correct description of the preferred embodiments shown in the figures.

Additional subject matter in detailed description is taken from the summary of invention section, especially page 15.

Various corrections were made to correct spelling errors and poor grammar in the specification.

Should the Examiner require or consider it advisable that the specification,

claims and/or drawing be further amended or corrected in formal respects to put this case in condition for final allowance, then it is requested that such amendments or corrections be carried out by Examiner's Amendment and the case passed to issue. Alternatively, should the Examiner feel that a personal discussion might be helpful in advancing the case to allowance, he or she is invited to telephone the undersigned at 1-631-549-4700.

In view of the foregoing, favorable allowance is respectfully solicited.

Respectfully submitted,

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